ELSEVIER

Volume 67, Numbers 1–3, November 1994

SYNTHETIC METALS

Contents

Sponsors xi

Preface 1

Articles

Light-emitting diodes fabricated with conjugated polymers – recent progress 3
D.R. Baigent, N.C. Greenham, J. Grüner, R.N. Marks, R.H. Friend, S.C. Moratti, A.B. Holmes (Cambridge, UK)

Electronic and chemical structure of conjugated polymers and their interfaces: experiment, theory and a glance toward the future 11
W.R. Salaneck (Linköping, Sweden), J.L. Brédas (Mons, Belgium)

Electronic band structure of conjugated polymers 15
W.R. Salaneck (Linköping, Sweden), J.L. Brédas (Mons, Belgium)

Carrier injection into semiconducting polymers: Fowler–Nordheim field-emission tunneling 23
A.J. Heeger, I.D. Parker, Y. Yang (Santa Barbara, CA, USA)

Characterization of nonlinear optical properties by hyper-scattering techniques 31
A. Persoons, K. Clays, M. Kauranen, E. Hendrickx, E. Put, W. Bijnens (Leuven, Belgium)

Is there an interaction at the aromatic site(s) in a metal/polymer interface? An XPS and HREELS review. 39
J.J. Pireaux (Namur, Belgium)

Scanning tunnelling microscopy of alkylated oligothiophenes at interfaces with graphite 47
A. Stabel, J.P. Rabe (Mainz, Germany)

Preparation and properties of highly oriented polytetrafluoroethylene films 55
M. Schott (Paris, France)

Surface, transforms and interfaces; the SMART direction for polymer science 63
D.T. Clark (Warrington, UK)

Chemical vapour deposition of poly(1,4-phenylenevinylene) films 71
E.G.J. Staring, D. Braun, G.L.J.A. Rikken, R.J.C.E. Demandt, Y.A.R.R. Kessener, M. Bouwmans, D. Broer (Eindhoven, Netherlands)

Polymeric optochips: splitters, switches and modulators 77
G.R. Möhlmann (Arnhem, Netherlands)

The evolution of charge-induced gap states in degenerate and non-degenerate conjugated molecules and polymers as studied by photoelectron spectroscopy. 81
P. Dannetun (Paris, France), M. Lögdlund, M. Fahlman, C. Fauquet (Linköping, Sweden), D. Beljonne, J.L. Brédas (Mons, Belgium), H. Bässler (Marburg, Germany), W.R. Salaneck (Linköping, Sweden)

Highly ordered ultra-thin α5-thiophene films on SiO_2 and Si(100)+O(N_2O) 87
O. Böhme, Ch. Ziegler, W. Göpel (Tübingen, Germany)

Optical absorption studies of sodium doped poly(cyanoterephthalylidene) 93
P. Bröms, M. Fahlman, K.Z. Xing, W.R. Salaneck (Linköping, Sweden), P. Dannetun (Paris, France), J. Cornil, D.A. dos Santos, J.L. Brédas (Mons, Belgium), S. Moratti, A.B. Holmes, R.H. Friend (Cambridge, UK)

A joint theoretical and experimental study of the aluminium/polyethylene terephthalate interface. 97
A. Calderone, R. Lazzaroni, J.L. Brédas (Mons, Belgium), Q.T. Le, J.J. Pireaux (Namur, Belgium)

Electrode-limited photoinjection at metal/polymer interface 103
V. Cimrová, S. Nešpůrek, R. Kužel (Prague, Czech Republic), W. Schnabel (Berlin, Germany)

Elsevier Science S.A.

Interface properties of silver electrodes on two-dimensional polypyrrole films 109
Th. Hauber, D. Schmeißer (Tübingen, Germany), H. Naarmann (Ludwigshafen, Germany), W. Göpel (Tübingen, Germany)

Luminescent structures of porous silicon capped by conductive polymers 111
V.P. Parkhutik (Madrid, Spain), R. Diaz Calleja, E.S. Matveeva (Valencia, Spain), J.M. Martinez-Duart (Madrid, Spain)

Internal photoemission studies of metal/polymer interfaces 115
G.L.J.A. Rikken, Y.A.R.R. Kessener, D. Braun, E.G.J. Staring, R. Demandt (Eindhoven, Netherlands)

XPS analysis of Cu/Teflon interface irradiated by heavy ions 121
L. Wang, N. Angert, C. Trautmann, J. Vetter (Darmstadt,, Germany)

Some chemical and electronic structures of the non-conjugated polymer poly(3,3′-phthalidylidene-4,4′-biphenylene) 125
C.R. Wu (Linköping, Sweden), A. Lachinov (Ufa, Russian Federation), N. Johansson, S. Stafström, T. Kugler, J. Rasmusson, W.R. Salaneck (Linköping, Sweden)

I–V characteristics of the carbon black-filled polyethylene interface with tin electrodes 129
J. Hampl, V. Bouda (Prague, Czech Republic)

Interface formation between poly(2,5-diheptyl-*p*-phenylenevinylene) and calcium: implications for light-emitting diodes 133
P. Dannetun, M. Fahlman, C. Fauquet (Linköping, Sweden), K. Kaerijama, Y. Sonoda (Tsukuba, Ibaraki, Japan), R. Lazzaroni, J.L. Brédas (Mons, Belgium), W.R. Salaneck (Linköping, Sweden)

Electronic processes at interfaces involving conducting polymers 137
M.M.D. Ramos (Braga, Portugal), A.M. Stoneham (Didcot, UK), A.P. Sutton (Oxford, UK)

Theoretical study of the interaction between sodium and oligomers of poly(*p*-phenylenevinylene) and poly(*p*-phenylene) 141
M. Lögdlund (Mons, Belgium, and Linköping, Sweden), P. Dannetun (Linköping, Sweden, and Paris, France), C. Fredriksson, W.R. Salaneck (Linköping, Sweden), J.L. Brédas (Mons, Belgium)

A density-functional theory study of the aluminum/polythiophene interface 147
V. Parenté, R. Lazzaroni (Mons, Belgium), A. Selmani (Montreal, Que., Canada), J.L. Brédas (Mons, Belgium)

Theoretical modeling of the geometric and electronic structure of polymer/graphite interfaces 151
A. Calderone, V. Parenté, J.L. Brédas (Mons, Belgium)

Characterization of properties of polymeric light-emitting diodes over extended periods 157
F. Cacialli, R.H. Friend, S.C. Moratti, A.B. Holmes (Cambridge, UK)

Synthesis of a polyphenylene light-emitting copolymer 161
W.-X. Jing, A. Kraft, S.C. Moratti, J. Grüner, F. Cacialli, P.J. Hamer, A.B. Holmes, R.H. Friend (Cambridge, UK)

Transient electroluminescence in poly(*p*-phenylenevinylene) light-emitting diodes 165
S. Karg, V. Dyakonov, M. Meier, W. Rieß (Bayreuth, Germany), G. Paasch (Dresden, Germany)

Dynamics of photoexcitations in electric fields in poly(*p*-phenylenevinylene) diodes 169
U. Lemmer (Marburg, Germany), S. Karg (Bayreuth, Germany), M. Scheidler, M. Deussen (Marburg, Germany), W. Rieß (Bayreuth, Germany), B. Cleve, P. Thomas, H. Bässler (Marburg, Germany), M. Schwoerer (Bayreuth, Germany), E.O. Göbel (Marburg, Germany)

Study of charge carrier injection and luminescence processes in oligothiophene-based light-emitting diodes 173
H. Neureiter, W. Gebauer, C. Väterlein, M. Sokolowski (Würzburg, Germany), P. Bäuerle (Stuttgart, Germany), E. Umbach (Würzburg, Germany)

Charge transport in organic light-emitting diodes: polarons or holes 177
G. Paasch (Dresden, Germany), W. Rieß, S. Karg, M. Meier, M. Schwoerer (Bayreuth, Germany)

Electroluminescence and photoluminescence investigations of the yellow emission of devices based on ladder-type oligo(*para*-phenylene)s 181
J. Grüner, H.F. Wittmann, P.J. Hamer, R.H. Friend (Cambridge, UK), J. Huber, U. Scherf, K. Müllen (Mainz, Germany), S.C. Moratti, A.B. Holmes (Cambridge, UK)

Space charge limited injection into trap-free polymers 187
M.A. Abkowitz (Webster and Rochester, NY, USA), H. Antoniadis (Rochester, NY, USA), J.S. Facci, B.R. Hsieh, M. Stolka (Webster and Rochester, NY, USA)

Well-organized phthalocyanine Langmuir–Blodgett films incorporated into symmetrical (metal/thin organic film/metal) sandwich structures 193
M. Burghard, C.M. Fischer, M. Schmelzer, S. Roth (Stuttgart, Germany), P. Haisch, M. Hanack (Tübingen, Germany)

Transient electroluminescence of monolayer and bilayer sexithiophene diodes 197
P. Delannoy (Paris, France), G. Horowitz (Thiais, France), H. Bouchriha (Paris, France), F. Deloffre (Thiais and Nanterre, France), J.-L. Fave (Paris, France), F. Garnier, R. Hajlaoui (Thiais, France), M. Heyman (Paris, France), F. Kouki (Thiais, France), J.-L. Monge (Paris, France), P. Valat, V. Wintgens, A. Yassar (Thiais, France)

Inter-layer mixing effect on the transport properties of a dual-layer organic photoreceptor interface 201
A.A.W. Macartney, D.M. Goldie, R.A.G. Gibson (Dundee, UK), R.S. Gairns (Manchester, UK)

A.c. conductivity of thermally dedoped polyaniline 207
E.S. Matveeva, R. Diaz Calleja, E. Sanchez-Martinez (Valencia, Spain)

An investigation of doped polypyrrole by a combination of scanning tunnelling and atomic force microscopes 211
G. Dietler, M. Heuberger, S. Tresch (Fribourg, Switzerland), P. Bujard (Marly, Switzerland)

The charged excitations in thin films of α-sexithiophene within semi-transparent field-effect devices: investigation by optical spectroscopy of field-induced charge and by photoimpedance spectroscopy 215
M.G. Harrison, R.H. Friend (Cambridge, UK), F. Garnier, A. Yassar (Thiais, France)

Photoluminescence under selective excitation of thiophene oligomers: relationship to microcrystalline structure. 223
F. Deloffre, F. Garnier, P. Srivastava, A. Yassar (Thiais, France), J.-L. Fave (Paris, France)

In situ electrochemical ESR investigations of the growth of one- and two-dimensional polypyrrole films 227
J. Bacskai, G. Inzelt (Budapest, Hungary), A. Bartl, L. Dunsch, G. Paasch (Dresden, Germany)

Dielectric properties of calixarene thin films in a large frequency range. 231
R.B. Chaâbane, M. Gamoudi, G. Guillaud (Villeurbanne, France)

N-Allylpyrrole as a bifunctional precursor to electrically conducting and filmable organic polymers: synthesis and preliminary characterization. 235
G. Alagona, C. Ghio, M. Cavazza, L. Nucci, F. Pergola (Pisa, Italy), A. Colligiani (Portici, Italy)

New substituted polybenzo[*c*]thiophenes: controlling the n- and p-doping potentials 241
G. King, S.J. Higgins (Liverpool, UK), S.E. Garner, A.R. Hillman (Leicester, UK)

The photovoltaic effect in a platinum poly-yne. 245
A. Köhler, H.F. Wittmann, R.H. Friend, M.S. Khan, J. Lewis (Cambridge, UK)

Designing polypyrrole-based sensors: selective electrochemical cation in aza crown ethers 251
H. Korri Youssoufi, A. Yassar, S. Baïteche, M. Hmyene, F. Garnier (Thiais, France)

Multi-component polymeric composites 255
R. Kužel, I. Křivka (Prague, Czech Republic), J. Kubát (Gothenburg, Sweden), J. Prokeš, S. Nešpůrek (Prague, Czech Republic), C. Klason (Gothenburg, Sweden)

Electrochemical and photoelectrochemical investigations of polybithiophene films. 263
T. Morgenstern, U. König (Düsseldorf, Germany)

Spectroscopic and electrical investigations of undoped and doped α-oligothiophene thin films 267
D. Oeter, Ch. Ziegler, W. Göpel (Tübingen, Germany), H. Naarmann (Ludwigshafen, Germany)

Changes of conductivity and electrochemical properties of polypyrrole by ion implantation 273
S. Schiestel, G.K. Wolf (Heidelberg, Germany)

Structural control of the optical properties of thin films of oligothiophenes 277
A. Yassar, P. Valat, V. Wintgens, M. Hmyene (Thiais, France), F. Deloffre (Thiais and Nanterre, France), G. Horowitz, P. Srivastava, F. Garnier (Thiais, France)

Organized metal/organic film/metal heterostructures: a way towards molecular electronic devices? 281
M. Schmelzer, M. Burghard, C.M. Fischer, P. Bäuerle, H. Schier, S. Roth (Stuttgart, Germany), W. Göpel (Tübingen, Germany)

Energy formulation for electronic, optical and acoustical applications including interfacial properties and irreversible processes 287
N. Daher (Besançon, France)

Poly(3-decylthiophene) as $\chi^{(3)}$ active material in waveguides 293
S. Destri, W. Porzio, M. Nisoli, S. De Silvestri (Milan, Italy), D. Grando, S. Sottini (Florence, Italy)

Optical and electrical assessment of an electro-optical intensity modulator from the conjugated polymer poly(2,5-dimethoxy-*p*-phenylenevinylene) 299
R.W. Gymer, R.H. Friend, H. Ahmed, A.B. Holmes (Cambridge, UK)

Cascading of second-order processes in quadratic molecular media at the origin of very large cubic effects 303
P. Vidakovic, J. Zyss (Bagneux, France), D. Kim, W. Toruellas, G. Stegeman (Orlando, FL, USA), W.E. Moerner, R. Twieg, G. Bjorklund (Almaden, CA, USA)

Electronic structure of 4-BCMU polydiacetylene studied by angle-dependent photoelectron spectroscopy 309
W.R. Salaneck, M. Fahlman (Linköping, Sweden), C. Lapersonne-Meyer, J.-L. Fave, M. Schott (Paris, France), M. Lögdlund (Linköping, Sweden, and Mons, Belgium), J.L. Brédas (Mons, Belgium)

Electronic structure of π-conjugated arylene ethynylene polymers 315
D.A. dos Santos, J.L. Brédas (Mons, Belgium)

A theoretical study of the chemical structure of the non-conjugated polymer poly(3,3′-phthalidylidene-4,4′-biphenylene) 319
N. Johansson (Linköping, Sweden), A. Lachinov (Ufa, Russian Federation), S. Stafström, T. Kugler, W.R. Salaneck (Linköping, Sweden)

Author Index of Volume 67 323

Subject Index of Volume 67 325

The publisher encourages the submission of articles in electronic form thus saving time and avoiding rekeying errors. A leaflet describing our requirements is available from the publisher upon request.